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June 4, 1992

Ms. Donna R. Searcy  
Federal Communications Commission  
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Washington, D.C. 20554

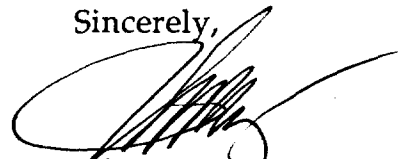
RE: ET Docket 92-9

Dear Madam Secretary:

Transmitted herewith are an original and nine copies of Rose Communications, Inc. comments in the above referenced proceeding.

If you have any questions with regard to this matter, please do not hesitate to contact me.

Sincerely,



John E. McNulty  
President and CEO

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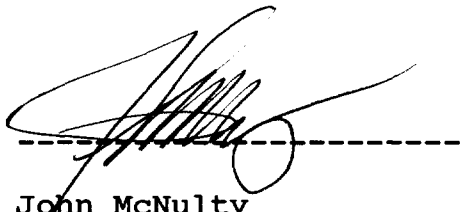
Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	ET Docket No. 92-9
Redevelopment of Spectrum to	)	
Encourage Innovation in the	)	
Use of New Telecommunications	)	
Technologies	)	

**Comments of Rose Communications Inc.**

Respectfully submitted,



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## SUMMARY

Rose Communications, Inc. requests the Commission to accelerate the allocation of spectrum to PCS and specifically to Wireless Telephony Office Systems (WTOS) which are poised to enter the on-premise office market quickly.

The spectrum identified in this proceeding can be made available to the office environment on a shared, non-interfering basis. Sharing, specifically between closed office systems and fixed microwave licensees, will allow the Commission to circumvent the protracted negotiations that will ensue if a significant amount of band-clearing is required prior to the release of the spectrum for other PCS applications.

The length of time and the difficulty of the transition period, between initial public PCS authorization and eventual relocation of the fixed users, will depend on the frequency band to which the fixed users are relocated. In the meantime, an initial allocation should be made to WTOS. Viable WTOS must provide high quality, high availability, and robust service. Hence, given the relatively low transmit power needed for WTOS, manufacturers would by necessity provide frequency agile interference avoiding solutions. The natural shielding of the on-premise office location coupled with minimum technical rules covering transmit power, spectrum use and bit rate will allow WTOS and fixed microwave to co-exist during the pendency of the negotiations on reallocation. Moreover, as on-premise WTOS is a natural non-licensed application, there will be no drawn-out licensing process to slow down the implementation of PCS in the office.

The transition period for PCS services in general can be diminished and the relocation costs can be dramatically reduced if the federal government would allow its 1710-1850 MHz band to be used as a relocation band for fixed microwave users in urban areas.

The federal government band is heavily used, but a cursory examination of the federal agencies that make up the majority of users makes it clear that government use is predominately fixed non-urban, while the requirement to relocate fixed microwave users is predominately urban. The NTIA report, TR 92-285, March 1992, discussed federal spectrum usage in the 1710-1850 MHz and 2200-2290 MHz bands. It reported that in the 1710-1850 MHz band: "About 87% of the total assignments in the band are for systems operating in the fixed service." Accordingly, these users are in known geographic locations and in known sections of the band.

It has also been noted that some non-fixed federal users are located in this band. These users are also located in discrete portions of the band. Those portions of the band which are occupied by non-fixed users in urban areas would naturally be off-limits to relocation. Even with that restriction, the urban/non-urban symmetry of government use and non-government demand leaves the greater part of the band available for relocation of non-government licensees.

This equilibrium of use and demand makes the government band the ideal band for the relocation of non-government fixed microwave users. Moreover, use of the adjoining government band will drive the cost of relocation down dramatically. Some microwave manufacturers have estimated the cost of relocation from the 1850-1990 MHz band to the adjoining 1710-1850 MHz band could be as low as \$8-10,000 per link. At this cost, the negotiations between PCS and fixed microwave licensees would move swiftly. In fact, the negotiations would be more form than substance, with the only real negotiation being between FCC and NTIA spectrum managers to select the frequency for relocation.

Sharing between government and non-government use is the key to PCS. NTIA is faced with the real possibility of "giving up" nearly 200 MHz of spectrum under legislative proposals being debated in Congress. If spectrum legislation included a provision that would credit the government (NTIA) for spectrum **shared with the FCC** for emerging technologies prior to the legislation passing, then real incentives would exist for government/non-government sharing in the 1710-1850 MHz band.

The Commission should work with both Congress and NTIA to solve the spectrum problem. Concurrently, they should move ahead and authorize WTOS, the one segment of PCS service that can operate interference and license-free in the shared environment of 2 GHz. The early deployment of PCS in the office environment will give U.S. manufacturers a decided advantage in the global wireless marketplace.

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

## Comments of Rose Communications Inc.

Rose Communications, Inc. ("Rose") respectfully submits these comments in the above captioned proceeding. Rose Communications is a wireless technology manufacturer currently developing an all digital Wireless Telephony Office System (WTOS) under the FCC's Part 15 rules (15.249). WTOS is a generic term which describes voice and low-speed data wireless systems used as part of an internal communications system by a closed user group. The acronym incorporates the generic terms wireless PBX/wireless Centrex and the "wireless business" description contained in the Telocator personal communications service (PCS) section's PCS Service Descriptions.

In this Notice of Proposed Rulemaking (NPRM), the FCC proposes to reallocate 220 MHz of spectrum between 1.85 and 2.20 Ghz for new and emerging technologies. The specific frequencies

proposed are 1.85 - 1.99, 2.11 - 2.15 and 2.16 - 2.20 GHz. This proceeding further proposes to establish the emerging technologies band for use by new services, or the expansion of existing services. In the notice the FCC said: "We anticipate that the first use of these emerging technology bands will be for the creation of a new personal communications service (PCS)."

Rose concurs with the FCC's optimism concerning early deployment of PCS; we also believe that the FCC can speed-up the early adoption of PCS in the marketplace by recognizing the different and distinct market segments that PCS will serve, addressing these segments separately, and encouraging the early adoption of PCS by the business sector of the marketplace.

WTOS is one of several specific applications of PCS: residence, office and public wireless access systems. We believe that each application will evolve separately within the family of personal communications services, with its own technology optimized to the specific application. Further, each separate application of PCS: WTOS, data PCS, wireless local loop, telepoint or public PCS, will require distinct regulatory treatment. WTOS and data PCS are natural non-licensed applications. Public PCS will require licensed spectrum and appropriate federal and state regulation.

**A. THE COMMISSION SHOULD ACCOMPLISH THE EARLY INTRODUCTION OF VARIOUS PCS SERVICES BY UNBUNDLING THE NON-LICENSED WIRELESS OFFICE TELEPHONY SERVICE FROM THE LICENSED PUBLIC PCS.**

Rose believes that PCS will not evolve as a monolithic generic

offering based on a common technology approach, but rather as a family of personal communications services addressing residence, office and public wireless access needs each using the optimum technology approach for the specific application.\*

Further, we are convinced that within that family of services, the initial and earliest application will be in the office environment. Most commentators concur that the business community will be the first and largest sector in the PCS marketplace. During the PCS en banc hearing, AT&T witness Mr. Dale Stone, in his response to a question about the evolution of market demand said, "the quickest markets to develop are related to the higher ability to pay and those tend to be the business customers." Mr. Stone went on to say "...the wireless in-building applications are likely to take off very rapidly...." We agree.

In the office environment, there is an unquestionable demand for mobility and freedom from the wired phone. For example, E-mail and voice mail are successful segments of office telecommunications because they liberate workers from the inconvenience associated with missed telephone messages while temporarily away from the work station. A personal communications device would permit even more freedom by allowing "real-time"

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\* Arthur D. Little, Inc. conducted a Wireless Personal Communications Delphi Research Project last year. The concept of multiple services was a key underlying finding which prevailed throughout the study -- "PCS is not a single service; it will be a wide range of complementary services." The study further identified Wireless PBX -- a key element of WTOS -- as one of those PCS services.

receipt of important messages while complementing voice mail for less urgent communications. WTOS is the logical next step in this evolution toward increased mobility and productivity.

Furthermore, WTOS is a natural non-licensed service. The obvious regulatory approach for WTOS is non-licensed open entry. The current "wired" office systems operate under a decades-old open entry registration scheme. The Carterphone decision, in the 1960's, ushered in an era of customer controlled, open entry in the premise equipment market.\* More recently, the complete deregulation of customer premise equipment has put unprecedented control over on-premise equipment in the hands of the end-user.

Wireless equipment can be easily integrated into this environment. With the application of minimum technical rules, which will be discussed later, on-premise wireless equipment can be operated interference-free and license-free under the control of the end-user. Any dissimilar regulatory treatment -- between wired and wireless office systems -- will drive up the cost and impose unacceptable and needless delays in the introduction of advanced wireless office systems.

Accordingly, the spirit of deregulation and customer control should be extended to wireless on-premise systems. There is

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\* The North American Telecommunications Association (NATA), made similar arguments to the Commission in their filing regarding issues addressed in the En Banc hearing. They concluded: "...if a restrictive licensing scheme is ultimately adopted for new off-premise [public PCS] services, the Commission must provide for open entry into the wireless premise systems market."

no legitimate reason to deviate from an open entry, deregulatory policy for on-premise wireless equipment.

On the contrary, non-licensed status for WTOS is dictated by the dynamics of the office itself. The initial success of the non-licensed approach can be seen in the early examples of WTOS which are operating under the liberal, non-licensed Part 15 rules. Even the early 46-49 MHz cordless phones, which are hardly comparable to the sophisticated digital WTOS proposed for use in the on-premise environment in the 2 GHz band, have operated satisfactorily. These early Part 15 systems have established the market's desire for tetherless phones. They have also established the need for non-licensed operation.

On the other hand, a licensed service provider's (i.e. common carrier) business is selling airtime. Within the office environment, charges for airtime or access fees are not feasible. While licensed operation is a proper regulatory approach for public PCS, it is not workable in an office environment. Not only would air-time charges be unacceptable, but any form of licensing would add unacceptable external costs to the price of the wireless office systems. Even a private licensing scheme like the one used with the Motorola Altair wireless data PCS system would be a mistake. The regulatory cost of acquiring the license and the scarcity value of the license would end up as incremental cost to the consumer in the sale of the end product.

In addition to the added cost involved in licensing WTOS, it

would be a mistake to encumber WTOS with the myriad of issues related to off-premise licensed PCS. These issues: license eligibility, state regulation, loop competition and technical compatibility are complex and will delay the regulatory process and the subsequent introduction of PCS into the business premise market. These issues do not apply to WTOS and should not be allowed to delay the swift availability of PCS to the business sector of the marketplace.

Accordingly, the regulation of WTOS must be within a structure appropriate for the needs of the office application: non-licensed. Separate and non-licensed treatment for WTOS will ensure the early deployment of wireless services to consumers and will also be in concert with two of the principal themes of PCS: the need to view PCS as a family of services and the need to begin deployment of PCS as quickly as possible.

A non-licensed structure, similar to the Part 16 framework discussed during the en banc hearing,\* could be developed with minimum technical regulations to protect against intra-service and inter-service interference.

**B. MINIMUM TECHNICAL REGULATIONS WOULD BE NEEDED UNDER A  
NON-LICENSED WTOS REGULATORY APPROACH**

Individual WTOS systems could operate interference-free

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\* During the en banc, the Chairman of McCaw Cellular, Mr. Craig McCaw called for the Commission to "...expedite service to the public through an initial allocation for services to residential and office environments under Part 16 licensing rules"

in the context of non-licensed operation with only minimum technical rules. Current technical rules governing non-licensed, low-powered, Part 15 devices which share spectrum with existing, and in some cases high powered users, provide some guidance in this respect.

The minimum technical rules which govern low-powered Part 15 transmitters deal mainly with power levels. Likewise, in newly structured rules for low-powered WTOS, transmit power specifications should control emissions to ensure reasonable cell size and spectrum efficiencies and assist in ensuring interference-free operation in a shared spectrum environment. Overall technical goals for the new WTOS rules should include:

- o Minimum standards of spectrum efficiency;
- o Technical regulations that are transparent to differing access methods i.e., applicable to all but favor none;
- o Clear method for designing and measuring for compliance;
- o Incentives for technical solutions that are more efficient than the minimum.

These goals can be optimized by developing a method of relating transmit power, spectrum usage and bit rate within the new rules. Rose has done some analysis of the relationship of these variables and how they could be structured to assist in maximizing efficiency while minimizing interference.

Our initial evaluation shows that an efficiency standard should be based on "Information Efficiency Per User." This measure of efficiency utilizes a relationship between the variables of power, spectrum (bandwidth of a user link/channel)

and the bit rate (with a maximum limit on power) where the calculation of an equation with these variables would be required to meet or exceed the criteria set forth in the new rules for WTOS.

It is also necessary to set practical limits for power (and perhaps bandwidth and bit rate) to avoid abuse of the spirit of the regulation - efficient use of spectrum. Specifics on Rose's proposed approach to minimum technical rules is contained in the filing Rose made to the FCC in January 1992 concerning the PCS en banc hearing.

In addition to these minimum technical rules, the closed office environment contains natural RF shielding (walls, floors, etc.) against potential interference, and represents a benign environment in which to gain valuable data on the suitability of co-primary sharing between microwave and PCS licensees. The natural shielding makes the office the least technologically troublesome PCS service to implement, and the market demand makes it a perfect application for the initial marketplace entry of PCS. Portable systems that may travel outside a WTOS-equipped, closed office environment, independent of central control, would be unable to share with the fixed microwave service and thus may require cleared spectrum.

The natural shielding against RF interference afforded by the office environment was discussed during the en banc hearing in December. Mr. Carl Bailey, witness for Chevron Information

Technology Company, and spokesperson for the Part 94 users licensed in the 1850-1990 MHz band, underscored the propagation isolation one finds in the office environment. In speaking of the 2 GHz band he said: "We don't feel the 1-3 GHz band is usable for PCS. It does not propagate well in buildings, homes or through other obstacles." He, of course, was commenting on the difficulty of propagating from outside buildings to users inside buildings. The same propagation protection works to the advantage of WTOS users, located inside buildings, who want to limit interference potential to fixed microwave users who are located outside buildings. The walls and floors in the office environment provide natural isolation between the office and the outside environment. Accordingly, WTOS is the ideal service to inaugurate PCS in a shared environment.

As a result, the Commission should unbundle, in a regulatory sense, the various PCS offerings and treat the family of PCS services separately. Unbundling of the separate PCS services applies to the service offerings, not to the underlying applications. Voice, low-speed data and video\* could all be provided on a co-equal basis within each PCS service offering. High-speed data (greater than 256 KB/s) requires separation in the spectrum due to the more rigid bit error rate limitations of high-speed data compared to voice.

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\* low-speed data and video operating at less than 256 KB/s

**C. THE COMMISSION SHOULD IMPLEMENT ITS REALLOCATION AND TRANSITION PLAN INCREMENTALLY, AND ALLOCATE 40 MHZ OF THE 1850-1990 MHZ BAND TO WTOS.**

The Commission's transition plan envisions the ultimate clearing of a significant portion of the emerging technologies band through negotiations between incumbent fixed users and new licensees. The extended transition plan however, assures that negotiations will be protracted and wireless services will be delayed to the American public. There is no need to delay the reallocation pending negotiations on the transition of existing users. The Commission, the PCS equipment vendors, the incumbent licensees and the public can both have their cake and eat it. The key is the incremental allocation of spectrum to the one PCS service that can co-exist on a co-primary basis without causing or receiving interference. That service is the in-building WTOS.

As noted earlier, PCS will evolve as a family of services; the initial service to reach the marketplace will be WTOS. The demand for wireless office systems coupled with the protection provided by the building environment, and minor technical rules dealing with power, static and dynamic channel allocation all add up to WTOS being the ideal first service offering to share spectrum with fixed users.

Accordingly, the Commission should allocate 40 MHZ of spectrum in the 1850-1990 band to inaugurate PCS in the office environment. The minimum amount of spectrum needed has been

established at about 40 MHz.\* This amount of spectrum would ensure user density needs can be met effectively. Further, cell size vs. user density could be optimized.

The 40 MHz should be in spectrum contiguous to the larger public PCS allocation. This would allow economies of scale in the equipment manufacturing process. This allocation could be accomplished by releasing the first increment of PCS spectrum at 1850-1890 MHz,\*\* and allocating it to WTOS. The WTOS vendor would implement the systems using the minimum technical rules established for the service under a new nonlicensed service.

WTOS would operate, initially, in unoccupied channels in 40 MHz of spectrum allocated from the 1850-1990 MHz PCS band. Most large cities have sufficient spectrum in that band that is not occupied. Studies conducted by several PCS experimental licensees have confirmed the availability of at least 50 MHz of spectrum in most large cities.\*\*\* Further, these studies concluded that the urban center -- where WTOS is most applicable -- is the least congested area of fixed microwave use. These findings were

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\* Hatfield and Associates conducted a study which analyzed the spectrum needs of PCS. Results of that study were provided to the FCC in a recent pioneer's preference filing for FMR Corp. (AMT).

\*\* Any 40 MHz block of spectrum in the 1850-1990 MHz band could be selected for WTOS. Of major importance however, is the need for contiguous spectrum for all PCS offerings. This will result in economies of scale in manufacturing which will translate into lower cost devices for the consumer.

\*\*\* APC studied 11 cities and found at least 50 MHz of unoccupied spectrum in this band. Cylink studied the San Francisco Bay area and found between 79 MHz (San Francisco) and 66 MHz (San Jose) unoccupied.

generally corroborated by the study performed by Telesis Technology Laboratory (TTL) and the Institute for Telecommunications Sciences (ITS).\*

In this study, which included, inter alia, measurements in the 1850-1990 MHz band in and around the San Francisco Bay area, they concluded that "The bands showing the lowest usage were the 2400-2483.5 MHz (ISM & Part 15), 1850-1990 MHz (Part 94) and 901-902 MHz (GPMRS) bands. In these bands, the 100% all-cities average [they analyzed four cities in addition to San Francisco] showed a minimum between 93% and 96% of the band unused."\*\*

With both unoccupied spectrum and low band usage on the occupied spectrum the 1850-1990 MHz band is ideal for sharing with the low-powered WTOS. Sharing of the WTOS channels with the fixed microwave systems can be done on a dynamic, real-time basis. Interference to and from fixed microwave systems would be avoided by real time measurements incorporated into the WTOS systems. Several technologies are being developed that would allow dynamic channel allocation based in part on the use of channel activity detection and automatic channel selection.\*\*\* In fact, the initial Rose product, which will be announced and begin production shipments in

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\* Spectrum Usage Measurements in Potential PCS Frequency Bands  
NTIA Report 91-279.

\*\* For the purpose of the ITS/TTL report, the percentage of frequency band unused means the percentage of frequencies in the band whose received signal levels never exceeded the selected threshold during measurements.

\*\*\* Southwestern Bell's IMASS, APC's FAST and Northern Telecom's PCI are technologies that will permit dynamic channel allocation.

June 1992, successfully utilizes this approach in the 2.4 GHz Part 15 band.

Rose believes such dynamic, real time sharing of WTOS channels with fixed microwave systems can be done so as to eliminate interference to and from the fixed microwave systems.

As noted earlier, the natural RF shielding of office floors and walls coupled with dynamic or static channel sharing will ensure WTOS can operate interference-free with existing licensees in the 1850-1990 MHz band.

Although sharing will allow the early deployment of wireless systems in the office environment, when the public licensed PCS systems begin deployment, competition for available channels will increase. The fixed users must be provided a reasonable long term relocation path which is operationally feasible and economically workable for both the fixed users and the public PCS user.

**D. THE COMMISSION SHOULD NEGOTIATE A CO-PRIMARY SHARING AGREEMENT WITH NTIA TO ALLOW DISPLACED MICROWAVE LICENSEES FROM THE 1850-1990 MHz TO RELOCATE TO THE ADJOINING GOVERNMENT CONTROLLED 1710-1850 MHz BAND.**

In the long term, as public PCS matures, the competition for unoccupied channels will require the ultimate relocation of some fixed users to an alternate band.\* In this NPRM, the Commission

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\* It should be noted that PCS, at least in its early stages will be an urban phenomenon. PCS in less urban areas will be slow to develop and then only in niche markets. As a result, the need to relocate will occur first and most heavily in urban areas and there will be no need to clear the band throughout the country.

recognizes the need for relocation. They have proposed relocating the existing 2GHz fixed users in "...higher frequency bands or to alternative media."\* The higher bands proposed were located between 3 and 19 GHz. A lengthy transition plan was also proposed to allow for the relocation. The Commission's transition plan, in this proceeding, for existing licensees in the 2 GHz band contains several elements: (1) grant applications for new fixed licensing on a secondary basis; (2) allow existing 2 GHz licensees (except for state and local licensees) to occupy spectrum on a co-primary basis for a period of 10 or 15 years; and (3) allow new licensees to negotiate financial arrangements with existing licensees in order to ease the transition to new spectrum or media.

It appears that the transition to the higher bands is not the total solution for the relocation of fixed users. The current licensees have complained about the propagation characteristics of the higher frequencies proposed by the FCC. They have also identified the higher costs associated with relocation outside of the 2 GHz band.

Accordingly, the marketplace negotiation between existing licensees and co-primary public PCS licensees will be protracted. The location of the bands above 3 GHz to which the existing licensees would move are not as hospitable to certain fixed operations as the 2 GHz band. As noted by many commentators, the higher bands could affect the path propagation, antenna siting

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\* NPRM 92-2, at p.9

and could require relocation of existing terminal equipment. On a case-by-case, location-by-location basis, negotiations between existing and prospective licensees for space in this band will seriously delay the implementation of public PCS.

Additionally, uncertainty in specific spectrum allocations will impact equipment developers. Until the exact allocation for each service is known, the design of equipment will be sub-optimized (and therefore less cost-effective) to cover a greater number of variable spectrum alternatives.

The most practical solution for many of the current 2GHz licensees is to open the adjoining 1710-1850 MHz band for relocation. The use of the adjoining government controlled spectrum, as a relocation base for the microwave users who need to relocate from the 1850-1990 MHz band would accomplish several things: (1) it would reduce the transaction cost of relocation; (2) lower costs would contribute to quicker relocation; (3) the potential to free up large blocks of spectrum would provide a long term spectrum solution for PCS.

The 1710-1850 MHz band is currently used by the government primarily for fixed point-to-point microwave and some mobile, space and aeronautical operations. An analysis of this band would point out the geographic assignment symmetry between government users and prospective public PCS licensees in the adjoining 1850-1990 MHz band.

While PCS is predominately an urban phenomenon (especially in its initial application), government use of the adjoining 1710-1850 MHz band is predominately suburban (and rural). Space operations in the government band are limited to specific geographical locations in a discrete portion of the band. Aeronautical operations are associated with test range programs not normally in built-up urban locations. Finally government fixed operations dominate the use of this band and tend to be less urban than the proposed PCS operations. As a result, this band could accommodate a large number of fixed urban licensees from the adjoining 1850-1990 MHz band.

The recently released NTIA report on Federal Spectrum Usage of the 1710-1850 MHz and 2200-2290 MHz Bands\* identified several factors that point to this band as an ideal band to accommodate urban fixed microwave users displaced by the growth of PCS. Specifically, the report states that 87% of the total assignments in this band are for fixed, medium capacity microwave.

An analysis of the major users -- the Department of Agriculture and the Department of Defense make up nearly 60% of the fixed users -- clearly shows the rural and suburban nature of the deployment of assignments. Agriculture assignments are predominately in rural areas. Likewise, DOD assignments, especially the U.S. Army, which is the largest DOD user, uses these frequencies far from the dense core-city environment which is the primary target of PCS. Similarly, DOJ and DOE, which make

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\* NTIA Report, TR 92-285, March 1992

up an additional 25% of the assignments, will normally have the majority of these assignments in suburban or rural areas.

In some few locations there are government assignments at or near the core areas of large cities. This however, does not distract from the overwhelmingly favorable geographic balance and symmetry of government/non-government assignments. Sharing between the predominately non-urban government assignments and the predominately urban non-government licensees is not only feasible -- it's compelling.

Irrespective of the number of assignments in each band, the urban/non-urban distribution of the non-government/government licensees makes this the most attractive solution to the problem of where to relocate the fixed users from the PCS band.

Relocation to this adjoining band would virtually eliminate the lengthy negotiation process from the proposed transition plan. Because the government spectrum is alongside the current assignment to the private users, concerns about path profiles, antenna siting or propagation disappear and costs to relocate diminish. Informed estimates on the cost per link to relocate to the adjoining band range from \$8000-12,000.

With such minimal cost impact, relocation could occur at a rapid pace and negotiations would become pro-forma exercises involving basic coordination between the FCC and government spectrum managers to select the best frequency for the specific location to accommodate the fixed non-government user. Similarly,

operational time lost in the cutover would be reduced dramatically. Furthermore, sharing of spectrum between the FCC and NTIA is common. Cooperation between the FCC and NTIA has established many bands as dual-use government/non-government bands.

The real issue is not whether the FCC and NTIA can work together to come up with a satisfactory sharing solution, but the the timing of the sharing. Currently, NTIA is faced with the real possibility of "giving up" nearly 200 MHz under legislative proposals being debated in Congress. If that legislation would merely include a provision to permit "credit" for sharing of spectrum, prior to the passage of the final bill, negotiations between the FCC and NTIA would proceed quickly. Lacking such a provision, there is no incentive for NTIA to cooperate on sharing spectrum. In fact, if they did cooperate now, they could be subject to "paying now and paying later". This impasse must be broken and Congress has, with a stroke of a pen, the ability to solve the spectrum sharing problem.

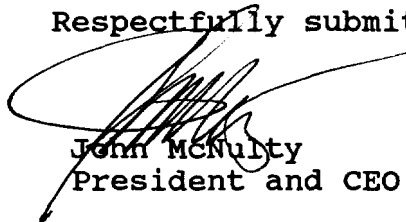
Notwithstanding the final solution to the relocation of fixed users, the Commission can, because of the physical properties of the office environment and the existence of dynamic and fixed sharing techniques, move quickly to bring advanced wireless technologies to the office environment.

### III. CONCLUSION

The Commission has identified the spectrum it will use to implement PCS: 2 GHz. The wireless industry has identified the initial entry for PCS: the office environment. Technology is available to allow sharing between WTOS and the fixed microwave licensees, and on-premise licensing is neither needed nor feasible.

All elements are in place to allow the Commission to "green-light" the launching of PCS in the office environment. We encourage the Commission to take this opportunity to vault the U.S. wireless industry into the lead in the global wireless marketplace.

Respectfully submitted,



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President and CEO

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